```
   1 AAAAAGAAAG GAAGAAAATG GAAATACAAC AAACACACCG CAAAATCAAT
  51 CGCCCTCTGG TTTCTCTCGC TTTAGTAGGA GCATTAGTCA GCATCACACC
 101 GCAACAAAGT CATGCCGCCT TTTTCACAAC CGTGATCATT CCAGCCATTG
 151 TTGGGGGTAT CGCTACAGGC ACCGCTGTAG GAACGGTCTC AGGGCTTCTT
 201 AGCTGGGGGC TCAAACAAGC CGAAGAAGCC AATAAAACCC CAGATAAACC
 251 CGATAAAGTT TGGCGCATTC AAGCAGGAAA AGGCTTTAAT GAATTCCCTA
 301 ACAAGGAATA CGACTTATAC AGATCCCTTT TATCCAGTAA GATTGATGGA
 351 GGTTGGGATT GGGGGAATGC CGCTAGGCAT TATTGGGTCA AAGGCGGGCA
 401 ACAGAATAAG CTTGAAGTGG ATATGAAAGA CGCTGTAGGG ACTTATACCT
 451 TATCAGGGCT TAGAAACTTT ACTGGTGGGG ATTTAGATGT CAATATGCAA
 501 AAAGCCACTT TACGCTTGGG CCAATTCAAT GGCAATTCTT TTACAAGCTA
 551 TAAGGATAGT GCTGATCGCA CCACGAGAGT GATTTCAACG CTAAAAATAT
 601 CTCAATTGAT AATTTTGCAG AAATCAACAA CTCGTGTGGG TTCTGGAGCC
 651 GGGAGGAAAG CCAGCTCTAC GGTTTTGACT TTGCAAGCTT CAGAAGGGAT
 701 CACTAGCGAT AAAAACGCTG AAATTTCTCT TTATGATGGT GCCACGCTCA
 751 ATTTGGCTTC AAGCAGCGTT AAATTAATGG GTAATGTGTG GATGGGCCGT
 801 TTGCAATACG TGGGAGCGTA TTTGGCCCCT TCATACAGCA CGATAAACAC
 851 TTCAAAAGTA ACAGGGGAAG TGAATTTTAA CCACCTCACT GTTGGCGATA
 901 AAAACGCCGC TCAAGCGGGC ATTATCGCTA ATAAAAAGAC TAATATTGGC
 951 ACACTGGATT TGTGGCAAAG CGCCGGGTTA AACATTATCG CTCCTCCAGA
1001 AGGTGGCTAT AAGGATAAAC CCAATAATAC CCCTTCTCAA AGTGGTGCTA
1051 AAAACGACAA AAATGAAAGC GCTAAAAACG ACAAACAAGA GAGCAGTCAA
1101 AATAATAGTA ACACTCAGGT CATTAACCCA CCCAATAGTG CGCAAAAAAC
1151 AGAAGTTCAA CCCACGCAAG TCATTGATGG GCCTTTTGCG GGCGGCAAAG
1201 ACACGGTTGT CAATATCAAC CGCATCAACA CTAACGCTGA TGGCACGATT
1251 AGAGTGGGAG GGTTTAAAGC TTCTCTTACC ACCAATGCGG CTCATTTGCA
1301 TATCGGCAAA GGCGGTGTCA ATCTGTCCAA TCAAGCGAGC GGGCGCTCTC
```

FIG. 1A

```
1351 TTATAGTGGA AAATCTAACT GGGAATATCA CCGTTGATGG GCCTTTAAGA
1401 GTGAATAATC AAGTGGGTGG CTATGCTTTG GCAGGATCAA GCGCGAATTT
1451 TGAGTTTAAG GCTGGTACGG ATACCAAAAA CGGCACAGCC ACTTTTAATA
1501 ACGATATTAG TCTGGGAAGA TTTGTGAATT TAAAGGTGGA TGCTCATACA
1551 GCTAATTTTA AAGGTATTGA TACGGGTAAT GGTGGTTTCA ACACCTTAGA
1601 TTTTAGTGGC GTTACAGACA AAGTCAATAT CAACAAGCTC ATTACGGCTT
1651 CCACTAATGT GGCCGTTAAA AACTTCAACA TTAATGAATT GATTGTTAAA
1701 ACCAATGGGA TAAGTGTGGG GGAATATACT CATTTTAGCG AAGATATAGG
1751 CAGTCAATCG CGCATCAATA CCGTGCGTTT GGAAACTGGC ACTAGGTCAC
1801 TTTTCTCTGG GGGTGTTAAA TTTAAAGGTG GCGAAAAATT GGTTATAGAT
1851 GAGTTTTACT ATAGCCCTTG GAATTATTTT GACGCTAGAA ATATTAAAAA
1901 TGTTGAAATC ACCAATAAAC TTGCTTTTGG ACCTCAAGGA AGTCCTTGGG
1951 GCACATCAAA ACTTATGTTC AATAATCTAA CCCTAGGTCA AAATGCGGTC
2001 ATGGATTATA GCCAATTTTT AAATTTAACC ATTCAAGGGG ATTTCATCAA
2051 CAATCAAGGC ACTATCAACT ATCTGGTCCG AGGTGGGAAA GTGGCAACCT
2101 TAAGCGTAGG CAATGCAGCA GCTATGATGT TTAATAATGA TATAGACAGC
2151 GCGACCGGAT TTTACAAACC GCTCATCAAG ATTAACAGCG CTCAAGATCT
2201 CATTAAAAAT ACAGAACATG TTTTATTGAA AGCGAAAATC ATTGGTTATG
2251 GTAATGTTTC TACAGGTACC AATGGCATTA GTAATGTTAA TCTAGAAGAG
2301 CAATTCAAAG AGCGCCTAGC CCTTTATAAC AACAATAACC GCATGGATAC
2351 TTGTGTGGTG CGAAATACTG ATGACATTAA AGCATGCGGT ATGGCTATCG
2401 GCGATCAAAG CATGGTGAAC AACCCTGACA ATTACAAGTA TCTTATCGGT
2451 AAGGCATGGA AAAATATAGG GATCAGCAAA ACAGCTAATG GCTCTAAAAT
2501 TTCGGTGTAT TATTTAGGCA ATTCTACGCC TACTGAGAAT GGTGGCAATA
2551 CCACAAATTT ACCCACAAAC ACCACTAGCA ATGCACGTTC TGCCAACAAC
2601 GCCCTTGCAC AAAACGCTCC TTTCGCTCAA CCTAGTGCTA CTCCTAATTT
2651 AGTCGCTATC AATCAGCATG ATTTTGGCAC TATTGAAAGC GTGTTTGAAT
```

FIG. 1B

2701 TGGCTAACCG CTCTAAAGAT ATTGACACGC TTTATGCTAA CTCAGGCGCT
2751 CAAGGCAGGG ATCTCTTACA AACCTTATTG ATTGATAGCC ATGATGCGGG
2801 TTATGCCAGA AAAATGATTG ATGCTACAAG CGCTAATGAA ATCACCAAGC
2851 AATTGAATAC GGCCACTACC ACTTTAAACA ACATAGCCAG TTTAGAGCAT
2901 AAAACCAGCG GCTTACAAAC TTTGAGCTTG AGTAATGCGA TGATTTTAAA
2951 TTCTCGTTTA GTCAATCTCT CCAGGAGACA CACCAACCAT ATTGACTCGT
3001 TCGCCAAACG CTTACAAGCT TTAAAAGACC AAAAATTCGC TTCTTTAGAA
3051 AGCGCGGCAG AAGTGTTGTA TCAATTTGCC CCTAAATATG AAAAACCTAC
3101 CAATGTTTGG GCTAACGCTA TTGGGGGAAC GAGCTTGAAT AATGGCTCTA
3151 ACGCTTCATT GTATGGCACA AGCGCGGGCG TAGACGCTTA CCTTAACGGG
3201 CAAGTGGAAG CCATTGTGGG CGGTTTTGGA AGCTATGGTT ATAGCTCTTT
3251 TAATAATCGT GCGAACTCCC TTAACTCTGG GGCCAATAAC ACTAATTTTG
3301 GCGTGTATAG CCGTATTTTA ACCAACCAGC ATGAATTTGA CTTTGAAGCT
3351 CAAGGGGCAC TAGGGAGCGA TCAATCAAGC TTGAATTTCA AAAGCGCTCT
3401 ATTACAAGAT TTGAATCAAA GCTATCATTA CTTAGCCTAT AGCGCTGCAA
3451 CAAGAGCGAG CTATGGTTAT GACTTCGCGT TTTTTAGGAA CGCTTTAGTG
3501 TTAAAACCAA GCGTGGGTGT GAGCTATAAC CATTTAGGTT CAACCAACTT
3551 TAAAAGCAAC AGCACCAATC AAGTGGCTTT GAAAAATGGC TCTAGCAGTC
3601 AGCATTTATT CAACGCTAGC GCTAATGTGG AAGCGCGCTA TTATTATGGG
3651 GACACTTCAT ACTTCTACAT GAATGCTGGA GTTTTACAAG AGTTCGCTCA
3701 TGTTGGCTCT AATAACGCCG CGTCTTTAAA CACCTTTAAA GTGAATGCCG
3751 CTCGCAACCC TTTAAATACC CATGCCAGAG TGATGATGGG TGGGGAATTA
3801 AAATTAGCTA AAGAAGTGTT TTTGAATTTG GGCGTTGTTT ATTTGCACAA
3851 TTTGATTTCC AATATAGGCC ATTTCGCTTC CAATTTAGGA ATGAGGTATA
3901 GTTTTCTAAAT ACCGCTCTTA AACCCATGCT CAAAGCATGG GTTTGAAATC
3951 TTACAAAACA

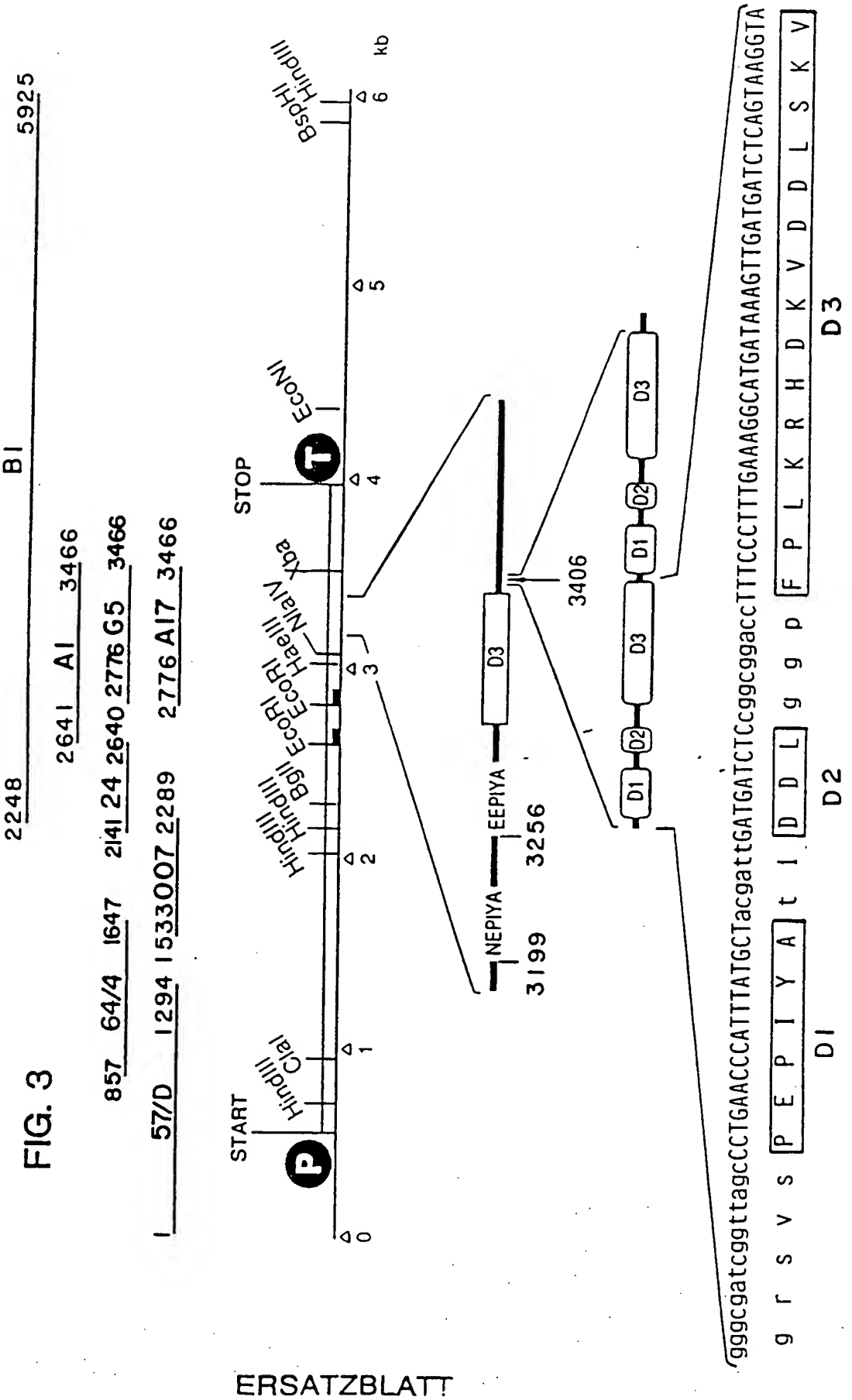
phe

FIG. 1C

```
   1 MEIQQTHRKI NRPLVSLALV GALVSITPQQ SHAAFFTTVI IPAIVGGIAT
  51 GTAVGTVSGL LSWGLKQAEE ANKTPDKPDK VWRIQAGKGF NEFPNKEYDL
 101 YRSLLSSKID GGWDWGNAAR HYWVKGGQQN KLEVDMKDAV GTYTLSGLRN
 151 FTGGDLDVNM QKATLRLGQF NGNSFTSYKD SADRTTRVIS TLKISQLIIL
 201 QKSTTRVGSG AGRKASSTVL TLQASEGITS DKNAEISLYD GATLNLASSS
 251 VKLMGNVWMG RLQYVGAYLA PSYSTINTSK VTGEVNFNHL TVGDKNAAQA
 301 GIIANKKTNI GTLDLWQSAG LNIIAPPEGG YKDKPNNTPS QSGAKNDKNE
 351 SAKNDKQESS QNNSNTQVIN PPNSAQKTEV QPTQVIDGPF AGGKDTVVNI
 401 NRINTNADGT IRVGGFKASL TTNAAHLHIG KGGVNLSNQA SGRSLIVENL
 451 TGNITVDGPL RVNNQVGGYA LAGSSANFEF KAGTDTKNGT ATFNNDISLG
 501 RFVNLKVDAH TANFKGIDTG NGGFNTLDFS GVTDKVNINK LITASTNVAV
 551 KNFNINELIV KTNGISVGEY THFSEDIGSQ SRINTVRLET GTRSLFSGGV
 601 KFKGGEKLVI DEFYYSPWNY FDARNIKNVE ITNKLAFGPQ GSPWGTSKLM
 651 FNNLTLGQNA VMDYSQFLNL TIQGDFINNQ GTINYLVRGG KVATLSVGNA
 701 AAMMFNNDID SATGFYKPLI KINSAQDLIK NTEHVLLKAK IIGYGNVSTG
 751 TNGISNVNLE EQFKERLALY NNNNRMDTCV VRNTDDIKAC GMAIGDQSMV
 801 NNPDNYKYLI GKAWKNIGIS KTANGSKISV YYLGNSTPTE NGGNTTNLPT
 851 NTTSNARSAN NALAQNAPFA QPSATPNLVA INQHDFGTIE SVFELANRSK
 901 DIDTLYANSG AQGRDLLQTL LIDSHDAGYA RKMIDATSAN EITKQLNTAT
 951 TTLNNIASLE HKTSGLQTLS LSNAMILNSR LVNLSRRHTN HIDSFAKRLQ
1001 ALKDQKFASL ESAAEVLYQF APKYEKPTNV WANAIGGTSL NNGSNASLYG
1051 TSAGVDAYLN GQVEAIVGGF GSYGYSSFNN RANSLNSGAN NTNFGVYSRI
1101 LTNQHEFDFE AQGALGSDQS SLNFKSALLQ DLNQSYHYLA YSAATRASYG
1151 YDFAFFRNAL VLKPSVGVSY NHLGSTNFKS NSTNQVALKN GSSSQHLFNA
1201 SANVEARYYY GDTSYFYMNA GVLQEFAHVG SNNAASLNTF KVNAARNPLN
1251 THARVMMGGE LKLAKEVFLN LGVVYLHNLI SNIGHFASNL GMRYSF
```

FIG. 2

FIG. 3


B1
2248
5925
A1
2641
3466
2776 G5
2640
3466
2776 A17
2289
3466
1533007
1294
1647
64/4
857
57/D
1
START
STOP
HindIII
ClaI
HindIII
BglII
EcoRI
HaeIII
NlaIV
XbaI
EcoNI
BsphI
HindIII
kb
NEPIYA
EEPIYA
3199
3256
3406
D3
D2
D1
gggcgatcggttagcCCTGAACCCATTTATGCTacgattGATGATCTCggcggaccTTTCCCTTTGAAAGGCATGATAAAGTTGATGATCTCAGTAAGGTA
g r s v s P E P I Y A t l D D L g g p F P L K R H D K V D D L S K V
D1
D2
D3

```
    CTCCATTTTAAGCAACTCCATAGACCACTAAAGAAACTTTTTTTGAGGCTATCTTTGAAA
    GCTTAATTATACATGCTATAGTAAGCATGACACACAAACCAAACTATTTTTAGAACGCTT
    TCAAAAAGATTCATTTCTTATTTCTTGTTCTTATTAAAGTTCTTTCATTTTAGCAAATTT
    CTTTTTTCAATATTAATAATGATTAATGAAAAAAAAAAAAAATGCTTGATATTGTTGTAT
    TTGACACTAACAAGATACCGATAGGTATGAAACTAGGTATAGTAAGGAGAAACAATGACT
                                                          M  T
    AATAATCTTCAAGTAGCTTTTCTTAAAGTTGATAACGCTGTCGCTTCATACGATCCTGAT
 23 N  N  L  Q  V  A  F  L  K  V  D  N  A  V  A  S  Y  D  P  D
    CAATTAAGGGAAGAATACTCCAATAAAGCGATCAAAAATCCTACCAAAAAGAATCAGTAT
 63 Q  L  R  E  E  Y  S  N  K  A  I  K  N  P  T  K  K  N  Q  Y
    GAATCTTCCACAAAGAGCTTTCAGAAATTTGGGGATCAGCGTTACCGAATTTTCACAAGT
103 E  S  S  T  K  S  F  Q  K  F  G  D  Q  R  Y  R  I  F  T  S
    GAAAATATCATACAACCCCCTATCCTTGATGATAAAGAGAAAGCGGAGTTTTTGAAATCT
143 E  N  I  I  Q  P  P  I  L  D  D  K  E  K  A  E  F  L  K  S
    ATGGGCGTGTTTGATGAGTCCTTGAAAGAAAGGCAAGAAGCAGAAAAAAATGGAGAGCCT
183 M  G  V  F  D  E  S  L  K  E  R  Q  E  A  E  K  N  G  E  P
    GATGTCAAAGAAGCAATCAATCAAGAACCAGTTCCCCATGTCCAACCAGATATAGCCACT
223 D  V  K  E  A  I  N  Q  E  P  V  P  H  V  Q  P  D  I  A  T
    AATTTTTCTAAATTCACTCTTGGCGATATGGAAATGTTAGATGTTGAGGGAGTCGCTGAC
263 N  F  S  K  F  T  L  G  D  M  E  M  L  D  V  E  G  V  A  D
    TTAATGGGGAGTCATAATGGCATAGAACCTGAAAAAGTTTCATTGTTGTATGGGGGCAAT
303 L  M  G  S  H  N  G  I  E  P  E  K  V  S  L  L  Y  G  G  N
    AACAATGTGGCTACAATAATTAATGTGCATATGAAAAACGGCAGTGGCTTAGTCATAGCA
343 N  N  V  A  T  I  I  N  V  H  M  K  N  G  S  G  L  V  I  A
    GGCTCACAACGAGCATTAAGTCAAGAAGAGATCCAAAACAAAATAGATTTCATGGAATTT
383 G  S  Q  R  A  L  S  Q  E  E  I  Q  N  K  I  D  F  M  E  F
    ACTGAGATTAAAGATTTCCAAAAAGACTCTAAGGCTTATTTAGACGCCCTAGGGAATGAT
423 T  E  I  K  D  F  Q  K  D  S  K  A  Y  L  D  A  L  G  N  D
    AATGGGGATTTGAGCTACACTCTCAAAGATTATGGGAAAAAAGCAGATAAAGCTTTAGAT
463 N  G  D  L  S  Y  T  L  K  D  Y  G  K  K  A  D  K  A  L  D
    TATTCTAATTTCAAATACACCAACGCCTCCAAGAATCCCAATAAGGGTGTAGGCGTTACG
```

FIG. 4A


```
    ATCTGTCCTATTGATTTGTTTTCCATTTTGTTTCCCATGTGGATCTTGTGGATCACAAAC  120
    CATGTGCTCACCTTGACTAACCATTTCTCCAACCATACTTTAGCGTTGCATTTGATTTCT  240
    TTGTTAATTGTGGGTAAAAATGTGAATCGTCCTAGCCTTTAGACGCCTGCAACGATCGGG  360
    AATGAGAATGTTCAAAGACATGAATTGACTACTCAAGCGTGTAGCGATTTTTAGCAGTCT  480
    AACGAAACCATTGACCAACAACCACAAACCGAAGCGGCTTTTAACCCGCAGCAATTTATC  600
    N  E  T  I  D  Q  Q  P  Q  T  E  A  A  F  N  P  Q  Q  F  I
    CAAAAACCAATCGTTGATAAGAACGATAGGGATAACAGGCAAGCTTTTGAAGGAATCTCG  720
    Q  K  P  I  V  D  K  N  D  R  D  N  R  Q  A  F  E  G  I  S
    TTTTCAGACTTTATCAATAAGAGCAATGATTTAATCAACAAAGACAATCTCATTGATGTA  840
    F  S  D  F  I  N  K  S  N  D  L  I  N  K  D  N  L  I  D  V
    TGGGTGTCCCATCAAAACGATCCGTCTAAAATCAACACCCGATCGATCCGAAATTTTATG  960
    W  V  S  H  Q  N  D  P  S  K  I  N  T  R  S  I  R  N  F  M
    GCCAAACAATCTTTTGCAGGAATCATTATAGGGAATCAAATCCGAACGGATCAAAAGTTC 1080
    A  K  Q  S  F  A  G  I  I  I  G  N  Q  I  R  T  D  Q  K  F
    ACTGGTGGGGATTGGTTGGATATTTTTCTCTCATTTATATTTGACAAAAAACAATCTTCT 1200
    T  G  G  D  W  L  D  I  F  L  S  F  I  F  D  K  K  Q  S  S
    ACCACCACCGACATACAAGGCTTACCGCCTGAAGCTAGAGATTTACTTGATGAAAGGGGT 1320
    T  T  T  D  I  Q  G  L  P  P  E  A  R  D  L  L  D  E  R  G
    ATTGATCCCAATTACAAGTTCAATCAATTATTGATTCACAATAACGCTCTGTCTTCTGTG 1440
    I  D  P  N  Y  K  F  N  Q  L  L  I  H  N  N  A  L  S  S  V
    GGTGGTCCTGGAGCTAGGCATGATTGGAACGCCACCGTTGGTTATAAAGACCAACAAGGC 1560
    G  G  P  G  A  R  H  D  W  N  A  T  V  G  Y  K  D  Q  Q  G
    GGTGGTGAGAAAGGGATTAACAACCCTAGTTTTTATCTCTACAAAGAAGACCAACTCACA 1680
    G  G  E  K  G  I  N  N  P  S  F  Y  L  Y  K  E  D  Q  L  T
    CTTGCACAAAATAATGCTAAATTAGACAACTTGAGCGAGAAAGAGAAGGAAAAATTCCGA 1800
    L  A  Q  N  N  A  K  L  D  N  L  S  E  K  E  K  E  K  F  R
    CGTATTGCTTTTGTTTCTAAAAAAGACACAAAACATTCAGCTTTAATTACTGAGTTTGGT 1920
    R  I  A  F  V  S  K  K  D  T  K  H  S  A  L  I  T  E  F  G
    AGGGAGAAAAATGTTACTCTTCAAGGTAGCCTAAAACATGATGGCGTGATGTTTGTTGAT 2040
    R  E  K  N  V  T  L  Q  G  S  L  K  H  D  G  V  M  F  V  D
    AATGGCGTTTCCCATTTAGAAGTAGGCTTTAACAAGGTAGCTATCTTTAATTTGCCTGAT 2160
```

FIG. 4B

```
503 Y  S  N  F  K  Y  T  N  A  S  K  N  P  N  K  G  V  G  V  T
    TTAAATAATCTCGCTATCACTAGTTTCGTAAGGCGGAATTTAGAGGATAAACTAACCACT
543 L  N  N  L  A  I  T  S  F  V  R  R  N  L  E  D  K  L  T  T
    GAATTGGTTGGAAAAACTTTAAACTTCAATAAAGCTGTAGCTGACGCTAAAAACACAGGC
583 E  L  V  G  K  T  L  N  F  N  K  A  V  A  D  A  K  N  T  G
    CATTTAGAGAAAGAAGTAGAGAAAAAATTGGAGAGCAAAAGCGGCAACAAAAATAAAATG
623 H  L  E  K  E  V  E  K  K  L  E  S  K  S  G  N  K  N  K  M
    GCTAATAGAGACGCAAGAGCAATCGCTTACGCTCAGAATCTTAAAGGCATCAAAAGGGAA
663 A  N  R  D  A  R  A  I  A  Y  A  Q  N  L  K  G  I  K  R  E
    GAATTCAAAAATGGCAAAAATAAGGATTTCAGCAAGGCAGAAGAAACACTAAAAGCCCTT
703 E  F  K  N  G  K  N  K  D  F  S  K  A  E  E  T  L  K  A  L
    AATGCAGCTTTGAATGAATTCAAAAATGGCAAAAATAAGGATTTCAGCAAGGTAACGCAA
743 N  A  A  L  N  E  F  K  N  G  K  N  K  D  F  S  K  V  T  Q
    AAAGTTGATAATCTCAATCAAGCGGTATCAGTGGCTAAAGCAACGGGTGATTTCAGTAGG
783 K  V  D  N  L  N  Q  A  V  S  V  A  K  A  T  G  D  F  S  R
    CAAAAAAATGAAAGTCTCAATGCTAGAAAAAAATCTGAAATATATCAATCCGTTAAGAAT
823 Q  K  N  E  S  L  N  A  R  K  K  S  E  I  Y  Q  S  V  K  N
    AAAAACTTTTCGGACATCAAGAAAGAGTTGAATGCAAAACTTGGAAATTTCAATAACAAT
863 K  N  F  S  D  I  K  K  E  L  N  A  K  L  G  N  F  N  N  N
    CAAGCAGCTAGCCTTGAAGAACCCATTTACGCTCAAGTTGCTAAAAAGGTAAATGCAAAA
903 Q  A  A  S  L  E  E  P  I  Y  A  Q  V  A  K  K  V  N  A  K
    CCTTTGAAAAGGCATGATAAAGTTGATGATCTCAGTAAGGTAGGGCTTTCAAGGAATCAA
943 P  L  K  R  H  D  K  V  D  D  L  S  K  V  G  L  S  R  N  Q
    TTTGGCAATCTAGAGCAAACGATAGACAAGCTCAAAGATTCTACAAAACACAATCCCATG
983 F  G  N  L  E  Q  T  I  D  K  L  K  D  S  T  K  H  N  P  M
    TACGCTACTAACAGCCACATACGCATTAATAGCAATATCAAAAATGGAGCAATCAATGAA
```

FIG.4C

```
    N  G  V  S  H  L  E  V  G  F  N  K  V  A  I  F  N  L  P  D
    AAAGGATTGTCCCCACAAGAAGCTAATAAGCTTATCAAAGATTTTTTGAGCAGCAACAAA  2280
    K  G  L  S  P  Q  E  A  N  K  L  I  K  D  F  L  S  S  N  K
    AATTATGATGAAGTGAAAAAAGCTCAGAAAGATCTTGAAAAATCTCTAAGGAAACGAGAG  2400
    N  Y  D  E  V  K  K  A  Q  K  D  L  E  K  S  L  R  K  R  E
    GAAGCAAAAGCTCAAGCTAACAGCCAAAAAGATGAGATTTTTGCGTTGATCAATAAAGAG  2520
    E  A  K  A  Q  A  N  S  Q  K  D  E  I  F  A  L  I  N  K  E
    TTGTCTGATAAACTTGAAAATGTCAACAAGAATTTGAAAGACTTTGATAAATCTTTTGAT  2640
    L  S  D  K  L  E  N  V  N  K  N  L  K  D  F  D  K  S  F  D
    AAAGGTTCGGTGAAAGATTTAGGTATCAATCCAGAATGGATTTCAAAAGTTGAAAACCTT  2760
    K  G  S  V  K  D  L  G  I  N  P  E  W  I  S  K  V  E  N  L
    GCAAAAAGCGACCTTGAAAATTCCGTTAAAGATGTGATCATCAATCAAAAGGTAACGGAT  2880
    A  K  S  D  L  E  N  S  V  K  D  V  I  I  N  Q  K  V  T  D
    GTAGAGCAAGCGTTAGCCGATCTCAAAAATTTCTCAAAGGAGCAATTGGCCCAACAAGCT  3000
    V  E  Q  A  L  A  D  L  K  N  F  S  K  E  Q  L  A  Q  Q  A
    GGTGTGAATGGAACCCTAGTCGGTAATGGGTTATCTCAAGCAGAAGCCACAACTCTTTCT  3120
    G  V  N  G  T  L  V  G  N  G  L  S  Q  A  E  A  T  T  L  S
    AACAATAATGGACTCAAAAACGAACCCATTTATGCTAAAGTTAATAAAAAGAAAGCAGGG  3240
    N  N  N  G  L  K  N  E  P  I  Y  A  K  V  N  K  K  K  A  G
    ATTGACCGACTCAATCAAATAGCAAGTGGTTTGGGTGTTGTAGGGCAAGCAGCGGGCTTC  3360
    I  D  R  L  N  Q  I  A  S  G  L  G  V  V  G  Q  A  A  G  F
    GAATTGGCTCAGAAAATTGACAATCTCAATCAAGCGGTATCAGAAGCTAAAGCAGGTTTT  3480
    E  L  A  Q  K  I  D  N  L  N  Q  A  V  S  E  A  K  A  G  F
    AATCTATGGGTTGAAAGTGCAAAAAAAGTACCTGCTAGTTTGTCAGCGAAACTAGACAAT  3600
    N  L  W  V  E  S  A  K  K  V  P  A  S  L  S  A  K  L  D  N
    AAAGCGACCGGCATGCTAACGCAAAAAAACCCTGAGTGGCTCAAGCTCGTGAATGATAAG  3720
```

FIG.4D

```
1023 Y  A  T  N  S  H  I  R  I  N  S  N  I  K  N  G  A  I  N
     ATAGTTGCGCATAATGTAGGAAGCGTTCCTTTGTCAGAGTATGATAAAATTGGCTTC
1063 I  V  A  H  N  V  G  S  V  P  L  S  E  Y  D  K  I  G  F
     GTAAAAGACACTAATTCTGGCTTTACGCAATTTTTAACCAATGCATTTTCTACAGCA
1103 V  K  D  T  N  S  G  F  T  Q  F  L  T  N  A  F  S  T  A
     GGTTTCCAAAAATCTTAAAGGATTAAGGAATACCAAAAACGCAAAAACCACCCCTTG
1143 G  F  Q  K  S
     TGAATGCTACCAATTCATGGTATCATATCCCCATACATTCGTATCTAGCGTAGGAAG
     AACTCTGTAAAATCCCTATTATAGGGACACAGAGTGAGAACCAAACTCTCCCTACGG
     GACAGACACTAACGAAAGGCTTTGTTCTTTAAAGTCTGCATGGATATTTCCTACCCC
     CGAAAATTAATTAAGGGTTATAAAGAGAGCATAAACTAGAAAAAACAAGTAGCTATA
     GAAAAATCAGAAAAACCATAGGAATTATCACACCTTATAATGCCCAAAAAAGACGCT
     ATGCCTTTCAAGGTGAAGAGGCAGATATTATTATTTATTCCACCGTGAAAACTTGTG
     ATCTCATTTTTGTGGGTAAAAAGTCTTTCTTTGAGAATTTATGAAGCGATGAGAAGA
     CATTCTTCGCTTCAAAACGCTTTCATAAATCTCTCTAAAGCGCTTTATAATCAACAC
     TTATTAGCGTTACAATTTGAGCCATTCTTTAGCTTGTTTTTCTAGCCAGATCACATC
     CTGCAAATATCCTACAATAGCATCGCCCGAATGGATGAGTAGGGGGGGTGTTGAAAG
     TAAAATAATCACTTCGGGAAAATCTTTAAGGGAGTGAAATAATAACGCATGCAAGTT
     TGCGAAACATTCAAATAGCCTTGTTGTTTCAGGGCATTGTCATAAGCGTTGGATTGG
     GCTAAAATGCTTGGCTCAATCACGCCCACAATAGGGATTTTGGAATGCTTTTGCATC
     TTGAAAAAATCCAAAGCCTCTAAGCCAAATTGCTTGATCGTAGTGGGGTCTTTAGTG
     AGGCTTTTTAAAACGCTAAACCCTCCCACACCGCTATCAAAAACGCCTATTTTCATG
     TCTTCATTGTCCTTAGTTTGTTGCATTTTAGAATAGACAAAGCTT 5925
```

FIG. 4E

```
     E  K  A  T  G  M  L  T  Q  K  N  P  E  W  L  K  L  V  N  D  K
     AACCAGAAGAATATGAAAGATTATTCTGATTCGTTCAAGTTTTCCACCAAGTTGAACAATGCT  3840
     N  Q  K  N  M  K  D  Y  S  D  S  F  K  F  S  T  K  L  N  N  A
     TCTTATTACTGCTTGGCGAGAGAAAATGCGGAGCATGGAATCAAGAACGTTAATACAAAAGGT  3960
     S  Y  Y  C  L  A  R  E  N  A  E  H  G  I  K  N  V  N  T  K  G
     CTAAAAGCGAGGGGTTTTTTAATACTCCTTAGCAGAAATCCCAATCGTCTTTAGTATTTGGGA  4080

     TGTGCAAAGTTACGCCTTTGGAGATATGATGTGTGAGACCTGTAGGGAATGCGTTGGAGCTCA  4200
     GCAACATCAGCCTAGGAAGCCCAATCGTCTTTAGCGGTTGGGCACTTCACCTTAAAATATCCC  4320
     AAAAAGACTTAACCCTTTGCTTAAAATTAAGTTTGATTGTGCTAGTGGGTTCGTGCTATAGTG  4440
     ACAAAGATCAAGTTCAAAAAATCATAGAGCTTTTAGAGCAAATTGATCGCGCTCTTAACCAAA  4560
     TGCGATCAGAAGTGGAAAAATACGGCTTCAAGAATTTTGATGAGCTCAAAATAGACACTGTGG  4680
     GTAATCTTTCTTTCTTGCTAGATTCTAAACGCTTGAATGTGGCTATTTCTAGGGCAAAAGAAA  4800
     ATATCTTTAGCGCTATTTTGCAAGTCTGTAGATAGGTAATCTTTTCCAAAGATAATCATTAGA  4920
     AATACCCTTATAGTGTGAGCTATAGCCCCTTTTTGGGAATTGAGTTATTTTGACTTTAAATTT  5040
     GCCGCTCGCATGAAATTCCACTTTAGGGAATGCGTGTGCATTTTTTTTAAGGGCGTATTTTTG  5160
     GGCAAAATGCTCCATAAAATAGCCCTCAATTTTTTGAGCGATTAAGGGAAAATGCGTGCAACC  5280
     TCTAACAATTCGCCCTCTAAAATACTTTCTTCAATCAAAGGCACAAAAAGAGAAGTGGCTAAA  5400
     ATCGTCGCTTTTGTCCCTAGCACTAAAATAGGGGCGTTTTTATCTTTTACTTGTCGCTTGATC  5520
     TCTTCTAAAGCTAGAGCGCTCGCTGTGTTGCATGCCACAATCAATAATTCAATCTGGTGCGGT  5640
     CCATAAGGCACTCTAGCCGTATCGCCATAATAGATGATTTCATCAAATAATTGCGCTTTTAAA  5760
     ACACTTTTTTAATTTAATGGGATTAATTAGGGATTTTATTTTTCATTCATTAAGTTTAAAAAT  5880
```

FIG. 4F

```
        10                  30                  50
AAGCTTGCTGTCATGATCACAAAAAACACTAAAAAACATTATTATTAAGGATACAAAATG
                                                        M
        70                  90                  110
GCAAAAGAAATCAAATTTTCAGATAGTGCGAGAAACCTTTTATTTGAAGGCGTGAGGCAA
A  K  E  I  K  F  S  D  S  A  R  N  L  L  F  E  G  V  R  Q
       130                 150                 170
CTCCATGACGCTGTCAAAGTAACCATGGGGCCAAGAGGCAGGAATGTATTGATCCAAAAA
L  H  D  A  V  K  V  T  M  G  P  R  G  R  N  V  L  I  Q  K
       190                 210                 230
AGCTATGGCGCTCCAAGCATCACCAAAGACGGCGTGAGCGTGGCTAAAGAGATTGAATTA
S  Y  G  A  P  S  I  T  K  D  G  V  S  V  A  K  E  I  E  L
       250                 270                 290
AGTTGCCCAGTAGCTAACATGGGCGCTCAACTCGTTAAAGAAGTAGCGAGCAAAACCGCT
S  C  P  V  A  N  M  G  A  Q  L  V  K  E  V  A  S  K  T  A
       310                 330                 350
GATGCTGCCGGCGATGGCACGACCACAGCGACCGTGCTAGCTTATAGCATTTTTAAAGAA
D  A  A  G  D  G  T  T  T  A  T  V  L  A  Y  S  I  F  K  E
       370                 390                 410
GGTTTGAGGAATATCACGGCTGGGGCTAACCCTATTGAAGTGAAACGAGGCATGGATAAA
G  L  R  N  I  T  A  G  A  N  P  I  E  V  K  R  G  M  D  K
       430                 450                 470
GCTGCTGAAGCGATCATTAATGAGCTTAAAAAAGCGAGCAAAAAAGTAGGCGGTAAAGAA
A  A  E  A  I  I  N  E  L  K  K  A  S  K  K  V  G  G  K  E
       490                 510                 530
GAAATCACCCAAGTGGCGACCATTTCTGCAAACTCCGATCACAATATCGGGAAACTCATC
E  I  T  Q  V  A  T  I  S  A  N  S  D  H  N  I  G  K  L  I
       550                 570                 590
GCTGACGCTATGGAAAAAGTGGGTAAAGACGGCGTGATCACCGTTGAGGAAGCTAAGGGC
A  D  A  M  E  K  V  G  K  D  G  V  I  T  V  E  E  A  K  G
       610                 630                 650
ATTGAAGATGAATTGGATGTCGTAGAAGGCATGCAATTTGATAGAGGCTACCTCTCCCCT
I  E  D  E  L  D  V  V  E  G  M  Q  F  D  R  G  Y  L  S  P
```

FIG. 5A

```
      670                 690                 710
TATTTTGTAACGAACGCTGAGAAAATGACCGCTCAATTGGATAATGCTTACATCCTTTTA
Y  F  V  T  N  A  E  K  M  T  A  Q  L  D  N  A  Y  I  L  L
      730                 750                 770
ACGGATAAAAAAATCTCTAGCATGAAAGACATTCTCCCGCTACTAGAAAAAACCATGAAA
T  D  K  K  I  S  S  M  K  D  I  L  P  L  L  E  K  T  M  K

      790                 810           HindIII
GAGGGCAAACCGCTTTTAATCATCGCTGAAGACATTGAGGGCGAAGCTTTAACGACTCTA
E  G  K  P  L  L  I  I  A  E  D  I  E  G  E  A  L  T  T  L
      850                 870                 890
GTGGTGAATAAATTAAGAGGCGTGTTGAATATCGCAGCGGTTAAAGCTCCAGGCTTTGGG
V  V  N  K  L  R  G  V  L  N  I  A  A  V  K  A  P  G  F  G
      910                 930                 950
GACAGAAGAAAAGAAATGCTCAAAGACATCGCTATTTTAACCGGCGGTCAAGTCATTAGC
D  R  R  K  E  M  L  K  D  I  A  I  L  T  G  G  Q  V  I  S
      970                 990                1010
GAAGAATTGGGCTTGAGTCTAGAAAACGCTGAAGTGGAGTTTTTAGGCAAAGCTGGAAGG
E  E  L  G  L  S  L  E  N  A  E  V  E  F  L  G  K  A  G  R
     1030                1050                1070
ATTGTGATTGACAAAGACAACACCACGATCGTAGATGGCAAAGGCCATAGCGATGATGTT
I  V  I  D  K  D  N  T  T  I  V  D  G  K  G  H  S  D  D  V
     1090                1110                1130
AAAGACAGAGTCGCGCAGATCAAAACCCAAATTGCAAGTACGACAAGCGATTATGACAAA
K  D  R  V  A  Q  I  K  T  Q  I  A  S  T  T  S  D  Y  D  K
     1150                1170                1190
GAAAAATTGCAAGAAAGATTGGCTAAACTCTCTGGCGGTGTGGCTGTGATTAAAGTGGGC
E  K  L  Q  E  R  L  A  K  L  S  G  G  V  A  V  I  K  V  G
     1210                1230                1250
GCTGCGAGTGAAGTGGAAATGAAAGAGAAAAAAGACCGGGTGGATGACGCGTTGAGCGCG
A  A  S  E  V  E  M  K  E  K  K  D  R  V  D  D  A  L  S  A
     1270                1290                1310
ACTAAAGCGGCGGTTGAAGAAGGCATTGTGATTGGTGGCGGTGCGGCTCTCATTCGCGCG
T  K  A  A  V  E  E  G  I  V  I  G  G  G  A  A  L  I  R  A
```

FIG. 5B

```
      1330                1350                1370
GCTCAAAAAGTGCATTTGAATTTGCACGATGATGAAAAAGTGGGCTATGAAATCATCATG
A  Q  K  V  H  L  N  L  H  D  D  E  K  V  G  Y  E  I  I  M
      1390                1410                1430
CGCGCCATTAAAGCCCCATTAGCTCAAATCGCTATCAACGCTGGTTATGATGGCGGTGTG
R  A  I  K  A  P  L  A  Q  I  A  I  N  A  G  Y  D  G  G  V
      1450                1470                1490
GTCGTGAATGAAGTAGAAAAACACGAAGGGCATTTTGGTTTTAACGCTAGCAATGGCAAG
V  V  N  E  V  E  K  H  E  G  H  F  G  F  N  A  S  N  G  K
      1510                1530                1550
TATGTGGATATGTTTAAAGAAGGCATTATTGACCCCTTAAAAGTAGAAAGGATCGCTCTA
Y  V  D  M  F  K  E  G  I  I  D  P  L  K  V  E  R  I  A  L
      1570                1590                1610
CAAAATGCGGTTTCGGTTTCAAGCCTGCTTTTAACCACAGAAGCCACCGTGCATGAAATC
Q  N  A  V  S  V  S  S  L  L  L  T  T  E  A  T  V  H  E  I
      1630                1650                1670
AAAGAAGAAAAAGCGACTCCGGCAATGCCTGATATGGGTGGCATGGGCGGTATGGGAGGC
K  E  E  K  A  T  P  A  M  P  D  M  G  G  M  G  G  M  G  G
      1690                1710                1730
ATGGGCGGCATGATGTAAGCCCGCTTGCTTTTTAGTATAATCTGCTTTTAAAATCCCTTC
M  G  G  M  M  *
      1750                1770                1790
TCTAAATCCCCCCCTTTCTAAAATCTCTTTTTTGGGGGGGTGCTTTGATAAAACCGCTCG

      1810                1830
CTTGTAAAAACATGCAACAAAAAATCTCTGTTAAGCTT
```

FIG. 5C